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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,178	09/24/2002	Tadashi Takano	SIMTEK6458	6288

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/065,178	TAKANO ET AL.	
	Examiner	Art Unit	
	Burton S. Mullins	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *8,9 and 31* is/are withdrawn from consideration.

5)☒ Claim(s) *26-30* is/are allowed.

6)☒ Claim(s) *1-7 and 10-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-30 (Group I) in the response filed 3 June 2003 is acknowledged. Claim 31 is withdrawn from consideration.

2. Claims 8 and 9, directed to the species of Figures 7 and 9 are withdrawn from further consideration since they do not all depend upon or otherwise include each of the limitations of an allowed generic claim as required by 37 CFR 1.141.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority based on two applications filed in Japan on 28 September 2001. It is noted, however, that applicant has not filed certified copies of the two Japanese applications as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 112

4. Claims 1-7 and 10-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent claim 1, line 5, recitation "said drive unit" is indefinite and lacks antecedent basis. It is not clear if the "drive unit" comprises the "electrically assisted, manually powered unit," the "manual drive element," the "transmission," or the "electric motor," or a combination of these. Given the abstract language of the claim, it is difficult to

understand what "drive unit" refers to, or what the "mechanical force transmitting device" is. The latter appears to connect the manual drive element with something.

Recitation "...to apply a force said force sensor..." makes no sense. Should –to-- be inserted after "a force"?

Further, the examiner notes that applicant's amendment results in a confusing syntax in claim 1, because the claim language now suggests that the mechanical force transmitting device (lines 4-5) is the antecedent of the prepositional phrase "for sensing the manual force applied to said manual drive...," (lines 6-7) when it appears that only the "force sensor" (line 4) performs this function. Amendment and clarification is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-6 and 10-11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 5,878,831) in view of Tanaka et al. (US 5,831,180). Saito teaches an electrically assisted, manually powered unit (e.g., a bicycle; Fig.1) comprising: a manual drive element (pedals 34 and crankshaft 32) receiving a manual input force from an operator; an electric motor 39 for providing an assist force (c.4, lines 9-13); a transmission arrangement (not shown, c.4, line 6) for receiving a driving force from said manual drive

element and said electric motor and driving said unit; a force (torque) sensor (not shown) associated with crankshaft 32 for sensing the manual force (torque) applied to said manual drive element and delivering an output signal indicative of said manual force (c.4, lines 28-31; c.5, lines 49-53); a control 41 for controlling the operation of said electric motor (c.4, lines 31-32); said control having a sensor input stage (interface 62) receiving the signal from said force sensor; and a logic for determining the operation of said electric motor from at least said signal from said force sensor (c.5, lines 53-65). Saito further teaches "a mechanical force transmitting device for transmitting a force applied to said manual drive element" (pedals 34 and crankshaft 32) since the same crankshaft 32, or the bicycle's front chain ring (not numbered, Fig.1), or the chain itself (Fig.1), may be considered a "mechanical force transmitting device" which transmit forces applied by the user to the rear sprocket 37.

Saito does not teach that the force sensor operates without necessitating "significant displacement" of a component thereof.

Tanaka teaches a torque sensing device that detects torque applied to a rotary shaft. The sensor comprises a core 12 made of magnetorestrictive material and a detection coil 15 wound around the core. When torque is applied to the shaft 11, an electromotive force is induced in the coil according to the strain produced in the coil (abstract, c.6, lines 13-25). No "significant displacement" occurs between the parts of the sensor since the tensile and compressive forces applied to the magnetorestrictive core are microscopic in nature. Tanaka's sensor is small, highly sensitive and comprises few parts (c.2, lines 39-46).

It would have been obvious to modify Saito and provide a torque sensor per Tanaka since a small, sensitive detector with few parts would have been desirable to detect torque.

Regarding claim 3, strain detection occurs in Tanaka when torque is applied to the right side of the shaft 11 and a compressive force acts on the core (c.4, lines 3-5).

Regarding claims 4-6, the vehicle of Saito is a bicycle with propulsion elements or wheels 21 for propelling the vehicle over terrain.

Regarding claim 10, the crank-shaft of the bicycle of Saito is moveable in two opposed directions.

Regarding claim 11, Saito's motor operates in one driving direction since it is used on a bicycle.

7. Claims 1-5, 7 and 10-11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama et al. (US 5,818,189) in view of Tanaka et al. (US 5,831,180). Uchiyama teaches an electrically assisted, manually powered wheelchair comprising: a manual drive element (hand rim 67 and wheel hub 39) receiving a manual input force from an operator (c.5, lines 36-37); an electric motor 105 for providing an assist force (c.6, lines 39-44; Fig.7); a transmission arrangement (c.6, line 56-c.7, line 13; Figs.5&7) for receiving a driving force from said manual drive element and said electric motor and driving said unit; a force or torque sensor comprising a potentiometer unit 91 for sensing the manual force or torque applied to said manual drive element and delivering an output signal indicative of said manual force (c.6, 1-32); a control 98 for controlling the operation of said electric motor (c.6, lines 38-44); said control having a sensor input stage (interface 133, Fig. 9) receiving the signal from said force sensor 91; and a logic (CPU 134) for determining the operation of said electric motor from at least said signal from said force sensor (c.7, line 60-c.8, line 48). Uchiyama further teaches "a mechanical force transmitting device for

transmitting a force applied to said manual drive element" (hand rim 67 and wheel hub 39) since the same rim or hub may all be considered to transmit force applied by the user.

Uchiyama's potentiometer does not operate without necessitating "significant displacement" of a component thereof, per se.

Tanaka teaches a torque sensing device that detects torque applied to a rotary shaft. The sensor comprises a core 12 made of magnetorestrictive material and a detection coil 15 wound around the core. When torque is applied to the shaft 11, an electromotive force is induced in the coil according to the strain produced in the coil (abstract, c.6, lines 13-25). No "significant displacement" occurs between the parts of the sensor since the tensile and compressive forces applied to the magnetorestrictive core are microscopic in nature. Tanaka's sensor is small, highly sensitive and comprises few parts (c.2, lines 39-46).

It would have been obvious to modify Uchiyama and provide a torque sensor per Tanaka since a small, sensitive detector with few parts would have been desirable to detect torque.

Response to Arguments

8. Applicant's arguments filed 12 September 2003 have been fully considered but they are not persuasive. Notwithstanding the rejection of claims 1-7 and 10-25 under 35 U.S.C., second paragraph, applicant fails to provide convincing arguments as to why independent claim 1, with its recitation of a "mechanical force transmitting device..." distinguishes over Saito and Tanaka, or over Uchiyama et al. and Tanaka. Applicant states that in Tanaka, the sensor is placed "directly upon the manually operated element" and that applicant's sensor is "loaded by

a mechanical connection and thus may be fixed..." in a location where it cannot be damaged. While it appears to be true that Tanaka's sensor is on the shaft 11, it is not clear how applicant's claim 1 as currently amended distinguishes this feature, since the location of the sensor is not claimed. Tanaka's sensor is "loaded by a mechanical connection" since it is loaded when torque is applied to the shaft. Saito's sensor is also "loaded by a mechanical connection" since it senses manual force (torque) applied to the pedals 34 and shaft 32 (c.4, lines 28-31; c.5, lines 49-53). Regarding the "fixed" nature of the sensor, this limitation is not in the claim, nor is it clear what applicant means by "fixed". Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Finally, applicant fails to specifically address the second grounds of rejection based on Uchiyama et al. (US 5,818,189) in view of Tanaka et al.

Allowable Subject Matter

9. Claims 12-25 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not teach the claimed unit comprising, inter alia, an electric motor providing assist force in both directions (claim 12); or a helical spline connection in the transmission comprising the mechanical force transmitting device (claim 13); or a compensating sensor that does not experience a load but is in proximity to the force sensor to provide temperature compensation (claim 26).

10. Claims 26-30 are allowed. Applicant incorporates indicated allowable subject matter of claim 26 into independent claim 1. Regarding claim 29, the prior art does not teach the claimed electrically assisted, manually powered unit including, inter alia, first and second electrical devices providing applied force signals and positioned close enough to each other to experience the same temperature so as to provide a temperature compensated signal to the control input.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 703-305-7063. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. The central fax phone number for the organization where this application or proceeding is assigned is 703-872-

9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
December 5, 2003